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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,909	02/19/2004	Garth L. Wilkes	01640397AA	7573

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EXAMINER

FEELY, MICHAEL J

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No. 10/780,909	Applicant(s) WILKES ET AL.	
	Examiner Michael J. Feely	Art Unit 1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 6-19, and 25 rejected under 35 U.S.C. 102(b) as being anticipated by Brindoepe et al. (US Pat. No. 5,344,897).

Regarding claims 1-3 and 6, Brindoepe et al. disclose: *(1)* a method of making a monomeric functionalized oil, comprising the steps of: carbonating an epoxidized vegetable oil, wherein a carbonated vegetable oil is produced (column 2, lines 34-43 and 54-64); *(2)* wherein the epoxidized oil is epoxidized soybean oil (ESBO), (column 2, lines 34-43) and the produced carbonated oil is carbonated soybean oil (column 2, lines 34-43 and 54-64); *(3)* wherein the carbonating step includes reacting epoxidized soybean oil with carbon dioxide (column 2, lines 34-43 and 54-64); and *(6)* wherein the epoxidized oil is converted to carbonated oil without any significant side reactions occurring (column 2, lines 34-43 and 54-64).

Regarding claim 7, Brindoepe et al. disclose: *(7)* a method of producing a carbonated soybean oil, comprising reacting an epoxidized soybean oil (ESBO) with carbon dioxide (column 2, lines 34-43 and 54-64).

Regarding claims 8-15, Brindoepe et al. disclose: *(8)* a method of converting an epoxide ring to a five-membered cyclic carbonate ring comprising a step of reacting a starting material that contains an epoxide ring with carbon dioxide, wherein the epoxide ring is converted to a five

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membered cyclic carbonate ring (column 2, lines 54-64); **(9)** wherein the starting material is an epoxidized oil (column 2, lines 34-43); **(10)** wherein the starting material is an epoxidized vegetable oil (column 2, lines 34-43); **(11)** wherein the starting material is epoxidized soybean oil (ESBO) (column 2, lines 34-43); **(12)** wherein the material is converted to a carbonated oil (column 2, lines 34-43 and 54-64); **(13)** wherein the starting material is converted to a carbonated vegetable oil (column 2, lines 34-43 and 54-64); **(14)** wherein the starting material is converted to a carbonated soybean oil (CSBO) (column 2, lines 34-43 and 54-64); and **(15)** wherein the starting material is converted to a monomeric reaction product having the cyclic carbonate ring, without a significant side reaction occurring (column 2, lines 34-43 and 54-64).

Regarding claims 16 and 17, Brindoepe et al. disclose: **(16)** a modified vegetable oil comprising a carbonated vegetable oil (column 2, lines 34-43 and 54-64); **(17)** wherein the carbonated vegetable oil is carbonated soybean oil (column 2, lines 34-43 and 54-64).

Regarding claims 18 and 19, Brindoepe et al. disclose: **(18)** a modified vegetable oil comprising a vegetable oil containing cyclic carbonate groups (column 2, lines 34-43 and 54-64); and **(19)** wherein the vegetable oil is soybean oil (column 2, lines 34-43 and 54-64).

Regarding claims 25, Brindoepe et al. disclose: **(25)** a polyurethane network comprising a nonisocyanate polyurethane network produced from a carbonated vegetable oil (column 2, lines 34-43 and 54-64).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brindoepe et al. (US Pat. No. 5,344,897) in view of December et al. (US Pat. No. 6,471,843).

Regarding claims 4 and 5, Brindoepe et al. are as set forth above; however, they do not explicitly disclose (4) the use of a catalyst or (5) more specifically a tetrabutylammonium bromide (TBAB) catalyst for the carbonation reaction.

December et al. also disclose a reaction of an epoxy-functional compound with carbon dioxide, resulting in an expansion of the epoxide ring, forming a cyclic carbonate. Their reaction is performed in the presence of a tetra ammonium bromide catalyst (column 16, lines 52-62).

This disclosure demonstrates that catalysts, and more specifically TBAB, are known in the art as suitable catalytic materials for performing this ring expansion (carbonation) reaction. These catalysts would have been suitable regardless of the backbone of the epoxy-functional compound because only the epoxide functions are involved with the reaction. In light of this, it has been found that selection of a known material based on its suitability for intended use supports a *prima facie* obviousness determination.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a catalyst, and more specifically a TBAB catalyst, in the reaction of Brindoepe et al. because December et al. disclose that TBAB is known in the art as suitable catalytic material for performing the ring expansion (carbonation) reaction set forth in Brindoepe et al.

5. Claims 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brindoepe et al. (US Pat. No. 5,344,897) in view of Whelan et al. (US Pat. No. 3,072,613).

Regarding claims 20-24, Brindoepe et al. disclose: (20) a method of making a

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nonisocyanate polyurethane network comprising mixing (1) a carbonated vegetable oil and (2) a *primary amine* (column 2, lines 34-43 and 54-64); and (22) wherein the carbonated vegetable oil is a carbonated soybean oil (column 2, lines 34-43 and 54-64).

Brindoepe et al. do not explicitly disclose: (20) (2) an amine having a functionality of at least two; (21) wherein the carbonated vegetable oil and amine are mixed stoichiometrically at or within nearly balanced stoichiometrically; (23) wherein the amine is selected from the group consisting of ethylenediamine (ED), hexamethylenediamine (HMD), and tris(2-aminoethyl) amine (TA); and (24) wherein a viscous solution is produced from the mixing, and the viscous solution is transferred to a mold, followed by curing.

Whelan et al. disclose a method of forming a resinous polyurethane product (claims) by reacting cyclic carbonates (*produced by reacting an epoxy-functional compound with carbon dioxide*) (column 2, lines 41-56) with primary aliphatic diamines (*including ethylenediamine and hexamethylenediamine*) (column 3, lines 47-53), in essentially equimolar proportions so that the highest molecular weight products are produced (column 3, lines 70-73). The resulting materials, "are readily cast into tough, colorless films having excellent clarity and tear resistance by extrusion or solvent casting techniques," (column 1, lines 52-54).

The teachings of Whelan et al. demonstrate that diamines, such as ED and HMD, are known in the art as suitable primary amines used for forming a polyurethane from a carbonated epoxy-functional compound featuring cyclic carbonate groups. These diamines would have been suitable regardless of the backbone of the carbonated epoxy-functional compound because only the cyclic carbonate groups are involved with the reaction with the amines to form the polyurethane. In light of this, it has been found that selection of a known material based on its

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suitability for intended use supports a *prima facie* obviousness determination.

Whelan et al. also provide motivation to use equimolar proportions, resulting in the highest molecular weight compounds. Furthermore, they demonstrate that these types are polyurethanes are mold-curable, resulting in the formation of tough, colorless films having excellent clarity and tear resistance.

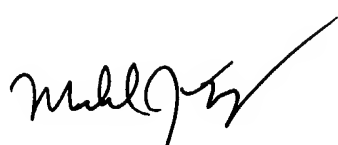
Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use ED or HMD as a primary diamine in equimolar stoichiometric proportions and to cure the reaction mixture of Brindoepe et al. in a mold because Whelan et al. demonstrate that ED and HMD are known in the art as suitable primary amines used for forming a polyurethane from a carbonated epoxy-functional compound featuring cyclic carbonate groups; wherein stoichiometric ratios of these compounds are preferred to yield the highest molecular weight compounds. Furthermore, they demonstrate that these types are polyurethanes are mold-curable, resulting in the formation of tough, colorless films having excellent clarity and tear resistance.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Feely whose telephone number is 571-272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael J. Feely
Patent Examiner
Art Unit 1712

September 17, 2004